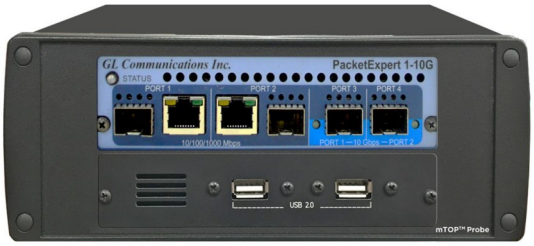
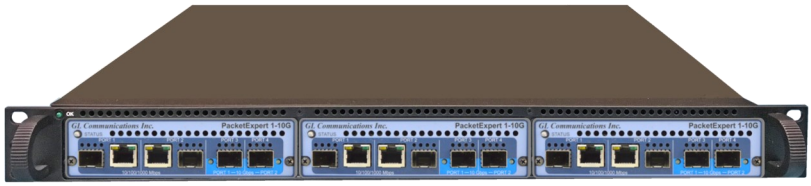
PacketExpert™ (1G/10G) Ethernet/IP Tester

(mTOP™ Rack and Probe Platforms)

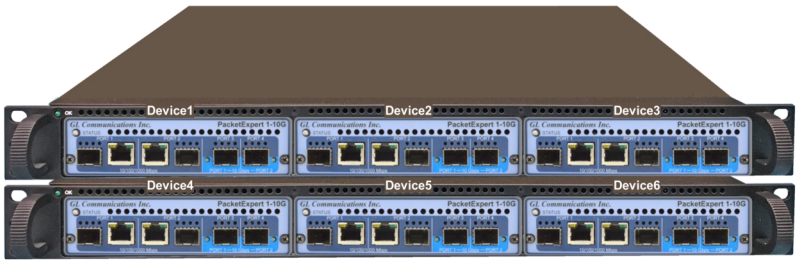


PacketExpert™ 10GX mTOP™ Probe
(Front view)



12-Port PacketExpert™ 10GX
mTOP™ 1U Rackmount

PacketExpert™ 10GX mTOP™ Probe
(Rear View)



24-Port PacketExpert™ 10GX
Stacked 1U mTOP™ Rackmount

Overview

GL offers multi-interface test appliance in two variants - mTOP™ 1U/2U rack enclosure and mTOP™ Probe unit.

- The **mTOP™ 1U/2U rack enclosure** can be stacked with multiple PacketExpert™ USB units to provide high density GigE ports form factor solution for testing GigE switches, routers and network conditions.
- The **mTOP™ Probe** variant is an all-in-one self-contained test instrument, which includes single PacketExpert™ USB units along with necessary PC hardware in a single box. The comprehensive mTOP™ Probe is designed for easier portability and convenient for drive testing.

Both mTOP™ variants include additional USB 2.0 and USB 3.0 ports (with support for mouse/keyboard), 2.5 GB Ethernet port, USB Type C ports, in-built PC with solid-state hard drive (up to 256 GB), standard 8 GB memory, and HDMI Interface, Windows® 11 64-bit OS. There are no moving parts with the unit, so reliability and longevity are integral.

Both the mTOP™ platforms includes PacketExpert™ 10GX (1G/10G) USB units. **PacketExpert™ 10GX** - capable of 1Gbps, 2.5Gbps and 10Gbps testing. It has two 10/2.5/1 Gbps Optical /Electrical ports, and two 1 Gbps Electrical/Optical ports. The 10 Gbps ports can be down-shifted to 1Gbps, thus allowing all 4 ports for 1 Gbps testing.

The PacketExpert™ 10GX hardware is more compact with reduced power requirements for high performance and adds 12-port user-configurable TTL trigger option as an important enhancement. BERT and Smart Loopback features are available on all (4 ports) 1 Gbps Electrical or Optical ports.

PacketExpert™ provides the important functionalities such as Wire speed BERT, RFC 2544 Testing, Smart Loopback, ExpertSAM, Record and Playback, PacketBroker, Multi Stream Traffic Generator and Analyzer, ExpertTCP and WAN IP link Emulation.

For more information, please visit Multi-Port GigE Ethernet/IP Tester webpage.

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Main Features

- High density Ethernet Ports with 12 (1G) or 6 (10G) ports on 1U mTOP™ rack. Stack multiple mTOP™ PacketExpert™ units to increase scalability of the solution and handle large number of ports
- mTOP™ Probe unit for portability and convenient field testing
- Flexibility in running multiple interface tests from a single mTOP™ test unit
- Selective-Port and Smart Loopback
- Wire-speed BERT, RFC 2544, ExpertSAM, Record Playback, PacketBroker, Multi Stream Traffic Generator and Analyzer, ExpertTCP, and WAN Link Emulation
- Layer1, Framed Ethernet (Layer2), Stacked MPLS (Layer2.5), IP (Layer3), and UDP (Layer4)
- User selectable Electrical and/or Optical interface allows mixed technology testing
- Generate and capture Ethernet traffic on Electrical/Optical (up to 10/100/1000 Mbps and 10 Gbps) interfaces
- All interfaces can run simultaneously and independently
- With PXN101 licensing, the unit supports testing on 2.5G/10G optical/electrical ports
- Detailed frame statistics in tabular format for all the ports
- Command line Interface (CLI) support requires CXN100 licenses to access all the functionalities remotely using Python, C# clients and MAPS™ CLI Client/Server architecture
- Real-time results are presented per port and all-port basis in both tabular as well as graphical formats
- Consolidated detailed test result reports for all the ports on all the devices in PDF and CSV file formats

Multi-Device Capability

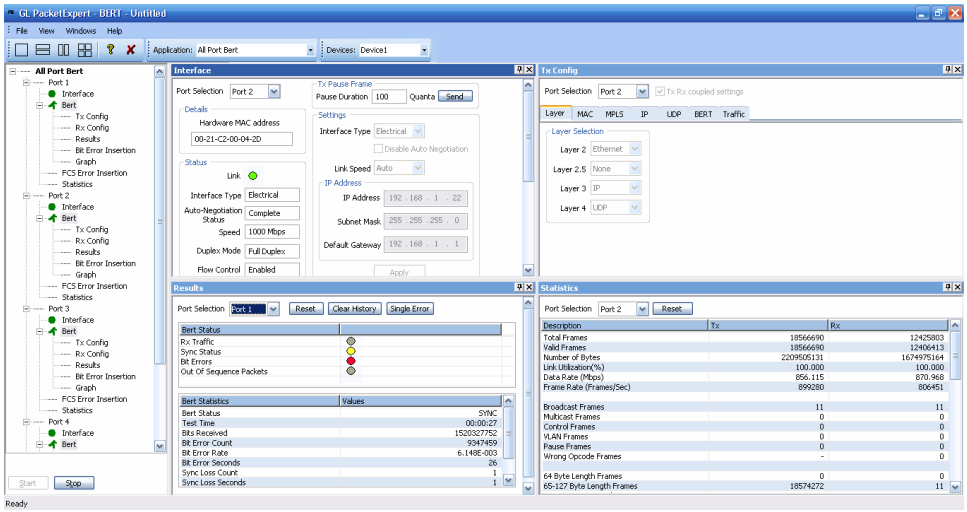
Applications	1U mTOP™ PacketExpert™ (12 ports)	1U Stacked mTOP™ PacketExpert™ (24 ports)
All Port BERT (Ports 1G: #1, #2, #3, #4 in each Device) (Ports 10G: #1, #2 in each Device)	1G: 12 ports 10G: 6 ports	1G: 24 ports 10G: 12 ports
BERT/Loopback (1G: BERT on Ports #1 & #3; Loopback on ports #2 & #4 in each Device) (10G: BERT on Port#1; Loopback on Port#2)	1G: 6 ports Bert, 6 ports Loopback 10G: 3 ports Bert, 3 ports Loopback	12 ports Bert, 12 ports Loopback
RFC 2544 (1G/10G: Ports #1 & #2 in each Device)	6 ports	12 ports
IPLinkSim™ (1G/10G: Ports #1 & #2 in each Device)	6 ports	12 ports
IPNetSim™ (1G/10G: Ports #1, & #2 in each Device)	6 ports	12 ports
ExpertSAM™ (1G/10G: Port #1 in each Device)	3 ports	6 ports
Record and Playback (1G/10G: Ports #1, #2 in each Device) Record Only (1G/10G: Ports #1 & #2 in each Device) Playback Only (10G: Ports #1, & #2 in each Device) (1G: Ports #1, #2, #3, #4 in each Device)	6 ports 10G: 6 ports 1G: 12 ports 10G: 6 ports 1G: 12 ports	12 ports 10G: 12 ports 1G: 24 ports 10G: 12 ports 1G: 24 ports
PacketBroker (Ports #1, #2, #3, #4 in each Device)	12 ports	24 ports
Multi Stream Traffic Generator and Analyzer (1G/10G: Port #1; Loopback on Port #2 in each Device)	3 ports MTGA, 3 ports Loopback	6 ports MTGA, 6 ports Loopback

Wire Speed BER Testing

Wire speed BERT measures Bit Error Rate on Framed Ethernet (Layer2), MPLS (Layer2.5), IP and UDP layers. Supports various PRBS patterns such as 2^9-1, 2^{11}-1, 2^{15}-1, 2^{20}-1, 2^{23}-1, 2^{29}-1, and 2^{31}-1 including constant patterns such as All Ones, All Zeroes, Alternate Ones-Zeroes and user-defined test patterns ranging from 1 bit to 32 bits.

The screen below displays the supporting PacketExpert™ software, which can easily control multiple hardware units from a single GUI, multiplying the number of ports available per system.

Users can configure the 4 ports individually available on each of the devices. HD-PacketExpert™ (12 Ports) includes 3 devices configurations and HD-PacketExpert™ (24 Ports) includes 6 devices configurations.



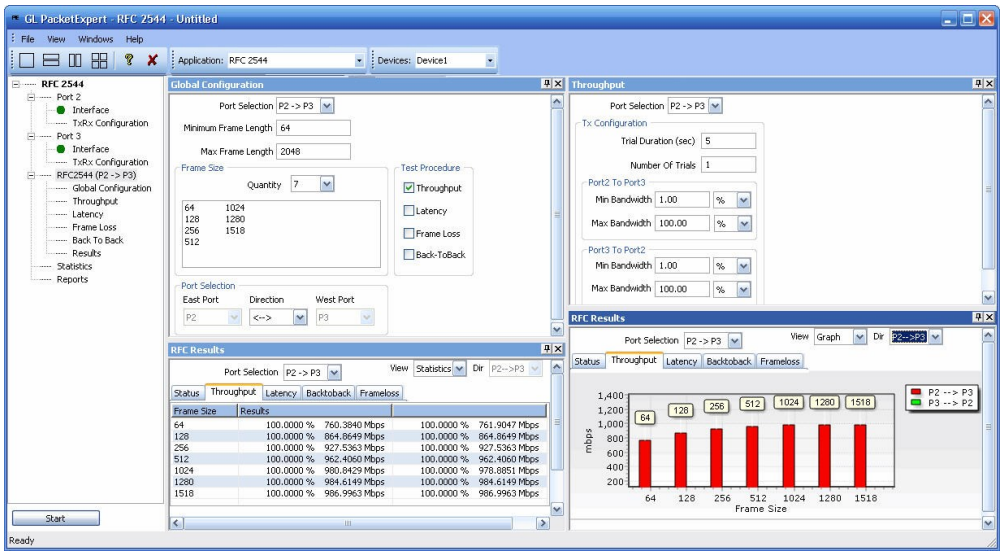
HD-PacketExpert™ GUI Depicting Multiport BERT Testing Support

RFC 2544 Testing

PacketExpert™ supports Throughput, Latency, Frame Loss and Back to Back tests as specified in RFC 2544. Similar to BERT, RFC 2544 can be done over Framed Ethernet (Layer2), Stacked VLAN (Q-in-Q), Stacked MPLS, IP or UDP.

RFC 2544 allows the test frame to be configured with Stacked VLAN and Stacked MPLS. This way, end to end RFC 2544 test can be conducted across a Carrier Ethernet/MPLS network.

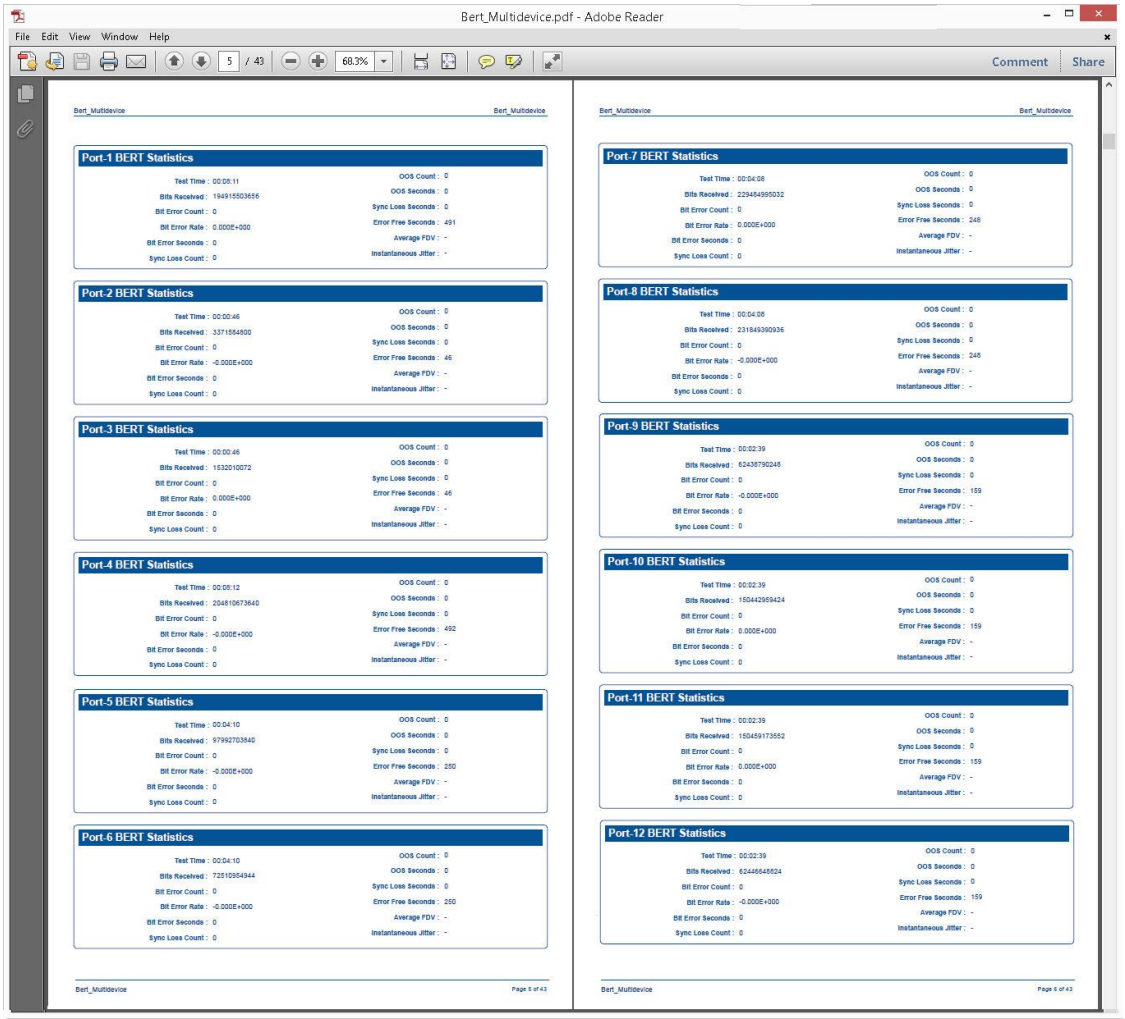
Users can configure the 4 ports individually available on each of the devices. HD-PacketExpert™ (12 Ports) includes 3 devices configurations and HD-PacketExpert™ (24 Ports) includes 6 devices configurations.



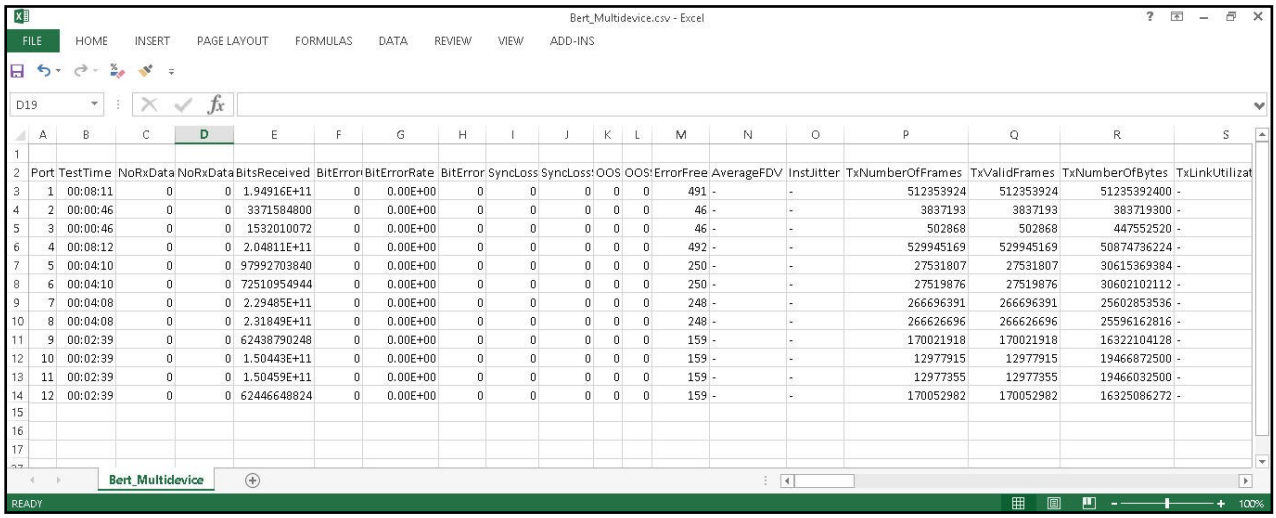
HD-PacketExpert™ GUI Depicting Multiport RFC2544 Testing Support

Report Generation

HD-PacketExpert™ includes report generation option to generate consolidated CSV and PDF file format reports for all the 12 (1G)/6 (10G) ports. The following sample CSV and PDF reports generated for 'All ports BERT' test includes Interface, BERT Statistics, Tx/Rx Statistics, Tx Configuration, and Rx Configuration details for each of the 12 (1G) /6 (10G) ports.



BERT Multi-device PDF Report

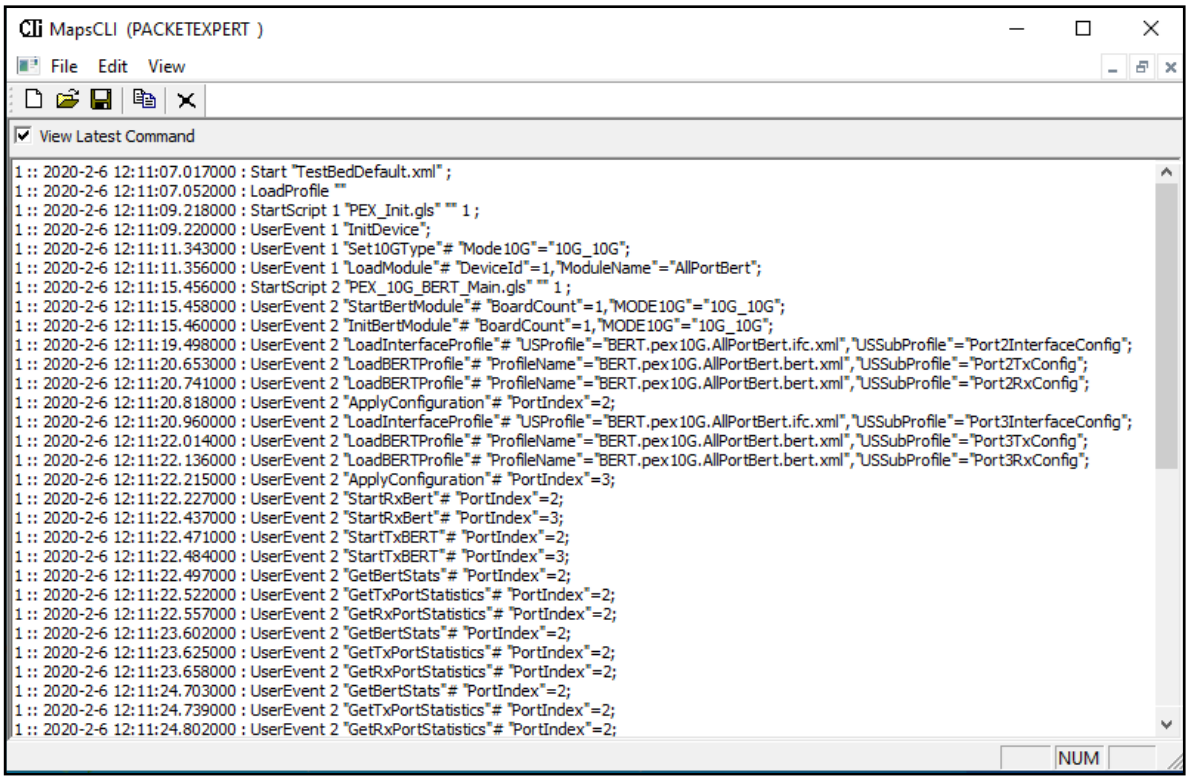


Port	TestTime	NoRxData	NoRxData	BitsReceived	BitError	BitErrorRate	BitError	SyncLoss	SyncLoss	OOS	OOS	ErrorFree	AverageFDV	InstJitter	TxNumberOfFrames	TxValidFrames	TxNumberOfBytes	TxLinkUtilizat
1	00:08:11	0	0	1.94916E+11	0	0.00E+00	0	0	0	0	0	491	-	-	512353924	512353924	51235392400	-
2	00:00:46	0	0	3371584800	0	0.00E+00	0	0	0	0	0	46	-	-	3837193	3837193	383719300	-
3	00:00:46	0	0	1532010072	0	0.00E+00	0	0	0	0	0	46	-	-	502868	502868	447552520	-
4	00:08:12	0	0	2.04811E+11	0	0.00E+00	0	0	0	0	0	492	-	-	529945169	529945169	50874736224	-
5	00:04:10	0	0	97992703840	0	0.00E+00	0	0	0	0	0	250	-	-	27531807	27531807	30615369384	-
6	00:04:10	0	0	72510954944	0	0.00E+00	0	0	0	0	0	250	-	-	27519876	27519876	30602102112	-
7	00:04:08	0	0	2.29485E+11	0	0.00E+00	0	0	0	0	0	248	-	-	266696391	266696391	25602853536	-
8	00:04:08	0	0	2.31849E+11	0	0.00E+00	0	0	0	0	0	248	-	-	266626696	266626696	25596162816	-
9	00:02:39	0	0	62438790248	0	0.00E+00	0	0	0	0	0	159	-	-	170021918	170021918	16322104128	-
10	00:02:39	0	0	1.50443E+11	0	0.00E+00	0	0	0	0	0	159	-	-	12977915	12977915	19466872500	-
11	00:02:39	0	0	1.50459E+11	0	0.00E+00	0	0	0	0	0	159	-	-	12977355	12977355	19466032500	-
12	00:02:39	0	0	62446648824	0	0.00E+00	0	0	0	0	0	159	-	-	170052982	170052982	16325086272	-

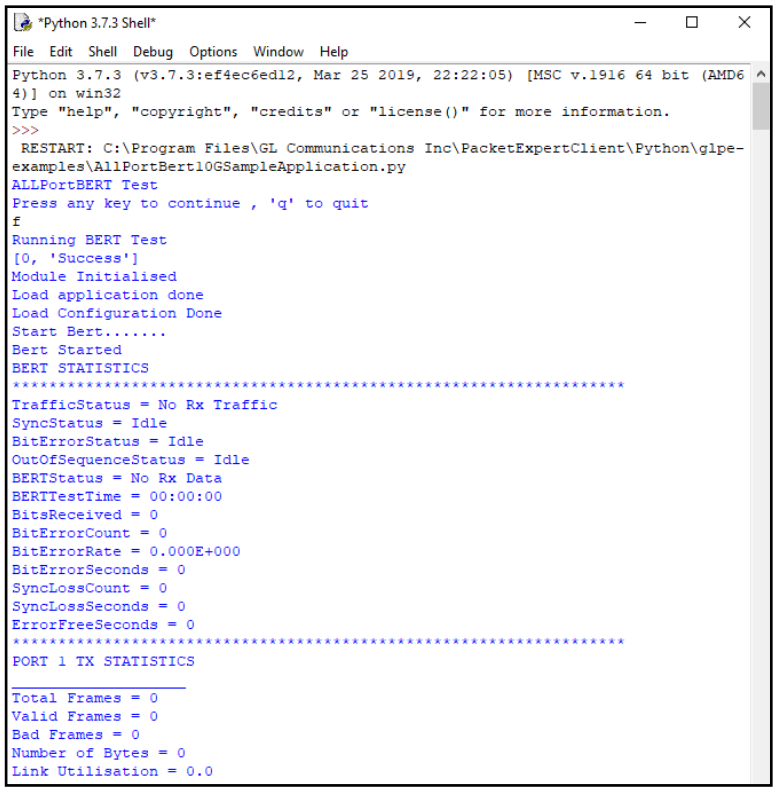
BERT Multi-device CSV Report

Remote Control

PacketExpert™ supports Command Line Interface (CLI) requires additional CXN100 licensing to remotely access all functionalities such as All Port Bert, All Port Loopback, Bert Loopback, RFC 2544, IP WAN Emulator, Record Playback, ExpertSAM™, and PacketBroker™ using Python, C# clients with MAPS™ CLI Server/Client architecture.

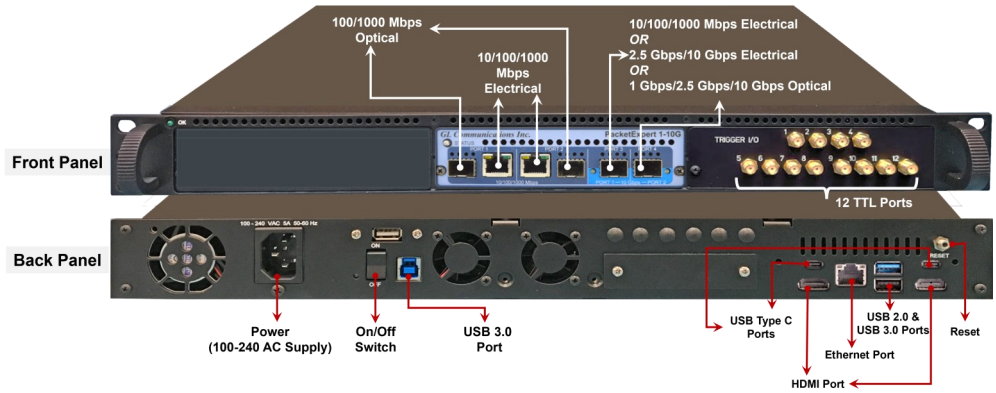


MAPS™ CLI Server for PacketExpert™

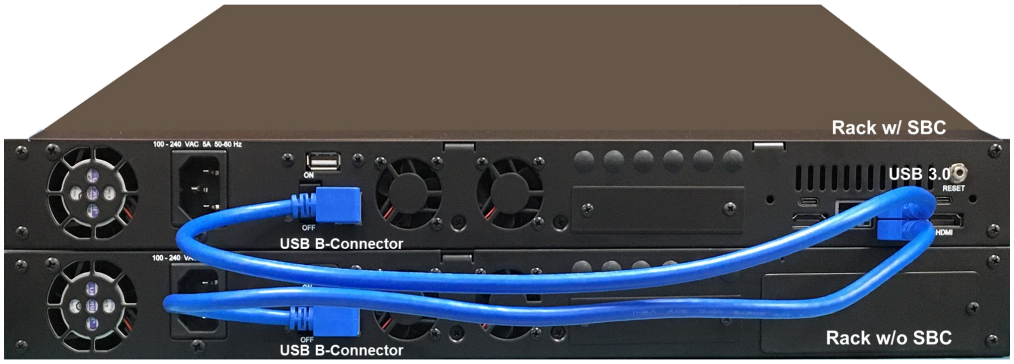


Command-Line based Python Client

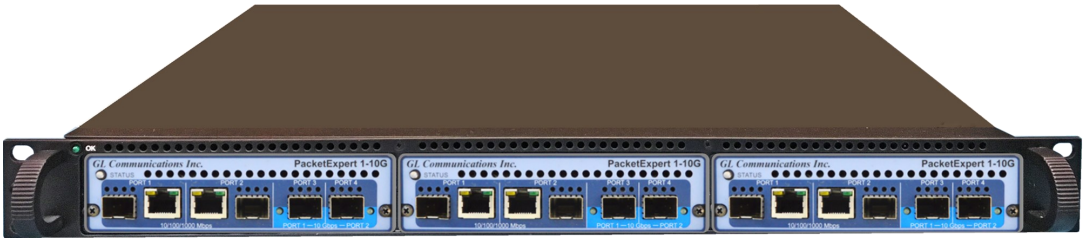
Specifications of mTOP™ PacketExpert™ 10GX Rack



1U mTOP™ Rack based 10GX Hardware Unit (with 12-Port TTL)



Stacked 1U mTOP™ Rack based 10GX Hardware Unit Back Panel



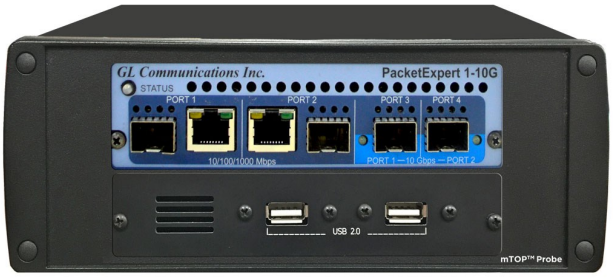
1U mTOP™ Rack based 10GX Hardware Unit (3x PXN100s)

Stacked 1U mTOP™ Rack based 10GX Hardware Unit (6x PXN100s)

Specifications of mTOP™ PacketExpert™ 10GX Rack

Interface:	**12 Total Ethernet ports** (HD-PacketExpert-12) • mTOP™ System (embedded SBC, 3x PXN100) • PacketExpert™ 10GX (PXN100) interfaces – – 6 x 1G Base-X Optical OR 10/100/1000 Base-T Electrical – 6 x 100 Mbps Base-FX Optical interface – 6 x 2.5G/10G Base-SR, -LR -ER Electrical/Optical interface **24 Total Ethernet Ports** (HD-PacketExpert-24) • mTOP™ 1 System (embedded SBC, 3x PXN100) • mTOP™ 2 System (w/o SBC, 3x PXN100) • 12 x 1G Base-X Optical OR 10/100/1000 Base-T Electrical • 12 x 100 Mbps Base-FX Optical interface • 12 x 2.5G/10G Base-SR, -LR -ER Electrical/Optical interface
Dimension:	• Length: 16 Inches • Width: 19 Inches • Height: 2x 1U mTOP™ (HD-PacketExpert-24) or 1U mTOP™ (HD-PacketExpert-12) **Weight:** (not including the rails) • 1U with 3x PXN100 : 11 lbs • 2U with 6x PXN100 : 22 lbs
Power Source	• ATX Power Supply
Temperature:	**Operating Temperature:** • 0° C to +50° C (only up to operating altitude of 5000 feet, and for Optical SFPs only i.e. Non Electrical SFPs) • +5° to +40° C (for operating altitude up to 10,000 feet, and for both Electrical and Optical SFPs) **Non-Operating Temperature**: • 30° to +60° C
Humidity:	• Operating Humidity: 0% to 80% RH • Non-Operating Humidity: 0% to 95% RH
Altitude:	• Operating Altitude: up to 10,000 feet • Non-Operating Altitude: up to 50,000 feet
Connectivity:	• Intel Core i3 or optional i7 Equivalent, Windows® 11 64-bit Pro Operating System • USB Type C ports, 2.5GigE Ethernet ports • USB 2.0 and USB 3.0 ports, ATX Power Supply • 256GB Hard drive, 8G Memory (Min) • Two HDMI ports for display
Order Information:	• PXN100/PXE100 • MT001/MT001E (1U) • MT001+MT002/ MT001E+MT002 (Stacked 1U)

Specifications mTOP™ 10GX Probe



(Front View)

(Rear View)

PacketExpert™ 10GX mTOP™ Probe with 10GX Hardware Unit

Interfaces	• 4x 1G Base-X Optical OR 10/100/1000 Base-T Electrical • 2x 2.5G/10G Base-SR, -LR -ER Optical/Electrical • 2 x 100 Mbps Base-FX optical interface • Single Mode or Multi Mode Fiber SFP support with LC connector • Optional 4-Port SMA Jack Trigger Board (TTL Input/Output) • External USB based Wi-Fi adaptor (optional)
SBC Specifications	• Intel NUC Core i3 or optional i7 Equivalent, Windows® 11 64-bit Pro Operating System • USB 2.0 and 3.0 ports, 12V/3A Power Supply • USB Type C ports, Ethernet 2.5GigE port • 256GB Hard drive, 8G Memory (Min) • Two HDMI ports
External Dimensions	• Length: 10.4 inches • Height: 3 inches • Width: 8.4 inches
Temperature	**Operating Temperature:** • 0° C to +50° C (only up to operating altitude of 5000 feet, and for Optical SFPs only i.e. Non Electrical SFPs) • +5° to +40° C (for operating altitude up to 10,000 feet, and for both Electrical and Optical SFPs) • **Non-Operating Temperature:** -30° to +60° C
Humidity	• Operating Humidity: 0% to 80% RH • Non-Operating Humidity: 0% to 95% RH
Altitude	• Operating Altitude: up to 10,000 feet • Non-Operating Altitude: up to 50,000 feet
Order information	• PXN100/PXE100 • MT005/MT005E • PacketExpert™ Options
Power Supply	• +12 Volts (Medical Grade), 3 Amps

Buyer's Guide

Item No	Product Description
PXN100	PacketExpert™ 10GX
PXN101	10G and 2.5g option for PXN100
PXN104	PacketExpert™ 10GX (4-Port) - Rackmount
PXN112	PacketExpert™ 10GX (12-Port) - Rackmount
PXN124	PacketExpert™ 10GX (24-Port) - Rackmount
MT001	mTOP™ 1U rack mount w/ SBC (Intel i3 Core)
MT001E	mTOP™ 1U rack mount w/ SBC (Intel i7 Core)
MT002	mTOP™ 1U rack mount w/o SBC
MT005	mTOP™ Probe (Intel i3 Core)
MT005E	mTOP™ Probe (Intel i7 Core)
CXE100	CLI Server for PXE100
CXN100	CLI Server for PXN100

Note: PCs which include GL hardware/software require Intel or AMD processors for compliance.

For more information, please visit Multi-Port GigE Ethernet/IP Tester webpage.

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